

Dental treatment apparatus.

5 The invention relates to an apparatus for dental treatment, comprising a base and a treatment unit, which treatment unit comprises one or more treatment instruments and one or more lines for the supply of water, air and electricity.

Such an apparatus is known.

10 The known apparatus has the drawback, that when this has to be serviced or when, as a result of a malfunction, repairs have to be carried out, the entire apparatus is out of use until the activities are completed.

It is an object of the present invention to obviate this drawback.

15 The apparatus according to the invention to that end is characterized in that in between the base and the treatment unit a connecting piece is provided by means of which the treatment unit can be disconnected from and connected to the base.

20 With the apparatus according to the invention it is possible to incorporate the technical part of a dental treatment apparatus in a treatment unit and to disconnect this treatment unit from the base. Because of this possibility of disconnection it is possible to provide all the technical parts, and as such, all the parts that are susceptible to malfunction, in a part that is interchangeable.

25 According to a further characteristic of the apparatus according to the invention the connecting piece is formed by a first part and a second part which are provided with cooperating connector parts for the supply of water, air and electricity, whereby, when the two parts are coupled to each other, the connector parts are connected to each other, in such a way that the lead-through of water, air and electricity from the  
30 base to the treatment unit is established, whereby the second part is provided with an opening through which a drawing pen is movable, while the drawing pen at one outer end is fixed to a cable and at the other outer end is provided with an inner flanged edge and, spaced there from, an outer flanged edge, whereby in between the inner flanged edge and the second part a spring is provided, by which the drawing pen is

supported on the second part and by means of which the drawing pen can be drawn against spring force through the opening by the cable, while the first part is provided with a first opening having a diameter such, that this can be moved over the outer flanged edge, while the first opening extends into a second opening, having a diameter which is smaller than the diameter of the outer flanged edge but which is larger than the diameter of the drawing pen, whereby, when the first part with the second opening is placed in between the flanged edges and leans against the outer flanged edge, by pulling the cable the first part is moved towards the second part, in such a way, that the connector parts are coupled to each other.

According to a further characteristic of the apparatus according to the invention the second part is provided with a sleeve in which the drawing pen is movable, while the spring is supported on the second part by means of the sleeve.

According to another characteristic of the apparatus according to the invention the one part is provided with at least two guide pens and the other part is provided with at least two guide holes for receiving the guide pens, in such a way that the first part and the second part can be connected to each other in a fixed position.

Further features and characteristics will be described with reference to the drawings of an example of an embodiment.

The figures 1, 2, 3a and 3b show the two cooperating parts of a connecting piece such as can be used in the apparatus according to the invention, whereby –

Figure 1 shows a perspective view of the second part;

Figure 2 shows a perspective view of the first part;

Figure 3a shows a side view of the second part;

Figure 3b shows a side view of the first part.

As can be seen in the figures 1 to 3b the connecting piece, such as can be used in the apparatus for dental treatment according to the invention, is formed by a first part 1 and a second part 2 which are provided with cooperating connector parts 4, 9 for the supply of water and air. Further the parts are provided with connector parts 5, 10 for

the supply of electricity. When the two parts 1, 2 are coupled to each other the connector parts 4, 9 and the connector parts 5, 10 are connected to each other. In the example of an embodiment shown the first part 1 is provided with three male connector parts 4 for the supply of water and air, and the second part 2 is provided with three female connector parts 9 for the supply of water and air.

When the connector parts 4 are connected to the connector parts 9 and when the connector part 5 is connected to the connector part 10, the lead-through of water, air and electricity from the base to the treatment unit is established. When disconnecting the connections between the connector parts 4, 9 the couplings for the water and air supply are automatically closed; because of this no "leak water" and "leak air" can develop. As can be seen in the figures the electronics is led through the upper connector parts 5, 10. Because of this, in case of any "post dripping" after the disconnection of the coupling, no short-circuiting can come about.

The second part 2 is provided with a central opening 13 through which a drawing pen 7 is movable, whereby the drawing pen 7 at one outer end 14 is fixed to a cable (not shown) and at the other outer end is provided with an inner flanged edge 15 and, spaced there from, an outer flanged edge 16. In between the inner flanged edge 15 and the second part 2 a spring 8 is provided, by which the drawing pen 7 is supported on the second part 2 and by means of which the drawing pen 7 can be drawn against spring force through the opening 13 by the cable. The first part 1 is provided with a central first opening 3 having a diameter such, that this can be moved over the outer flanged edge 16, while the first opening 3 extends into a second opening 17, having a diameter which is smaller than the diameter of the outer flanged edge 16 but which is larger than the diameter of the drawing pen 7. When the first part 1 with the second opening 17 is placed in between the flanged edges 15, 16 and leans against the outer flanged edge 16, by pulling the cable the first part 1 is moved towards the second part 2, in such a way, that the connector parts 4, 9 and 5, 10 are coupled to each other.

In the embodiment shown the second part 2 is provided with a guide sleeve 12 in which the drawing pen 7 is movable, while the spring 8 is supported on the second part 2 by means of the sleeve 12.

Further the second part 2 is provided with at least two conical guide pens 11 and the first part 1 is provided with at least two guide holes 6 for receiving the guide pens

11. In the example of an embodiment shown the guide pens 11 have a length such, that the outer ends 19 thereof extend beyond the inner flanged edge 15 of the drawing pen 7 when the drawing pen 7 is pushed out by the spring 8 that is supported by the second part 2. Further guide slots 18 extend into the guide holes 6 for  
5 receiving the outer ends 19 of the guide pens 11, in such a way, that when the parts 1, 2 are being connected to each other and when the drawing pen 7 is being moved from the first opening 3 into the second opening 17, the outer ends 19 of the guide pens 11 are forced by means of the guide slots 18 into the guide holes 6.

Because of this the female and male connectors for the supply of water, air and  
10 electricity will gradually couple with each other. Further, the first part and the second part can be connected to each other in a fixed position.

In an advantageous manner the space between the inner flanged edge 15 and the outer flanged edge 16 of the drawing pen 7 is only somewhat larger than the thickness of the first part 1, such that the first part 1 fits closely therein between. In  
15 this manner the displacement or tilting of the second part 2 relative to the first part 1 is prevented. Further, in the example of the embodiment the diameter of the inner flanged edge 15 is larger than the diameter of the first opening 3 in the first part, so that is prevented that during the coupling the first part is pushed over the inner flanged edge 15.

20 With the invention it is possible to incorporate the technical part of a dental treatment apparatus in a treatment unit and to disconnect this treatment unit from the base.

Because of this possibility of disconnecting it is possible to mount all the technical parts, more in particular the parts that are susceptible to malfunction, in an

25 interchangeable part. When the cable releases the drawing pen 7, the first part 1 will be pushed away from the second part 2 by the force of the pressure spring 8 and by the springs in the water and air connectors 4, 9. The water and air connections automatically are closed after the opening of the coupling.

30 By the three types of connectors that are used it is possible to mount all the electronics in the treatment unit. Because of this it is very simple to interchange only the treatment unit in the case of a breakdown.